

an ice sheet to form over Scandinavia. As the solar radiation still further decreased, the lack of precipitation caused the glaciers of the Alps to retreat. At the minimum of solar radiation there was a cold interglacial epoch with low mean temperature, a large annual variation of temperature, and very low precipitation; in fact, a truly continental climate.

With these changes of climate went a corresponding change in the flora, the sequence being park land, forest, tundra, grass with sparse trees, and steppe. In this way it has been found possible to determine a sequence of climates and of fauna and flora for the whole Pleistocene period, which is supported by the geological and archaeological evidence available. In particular it is possible to arrange the sequence of human culture, the geological strata of East Anglia, and the history of the ice in the Alps into the scheme of climate change.

The two maxima of solar radiation were accompanied by increased precipitation in all parts of the world, so accounting for the two pluvial periods which are known to have occurred during the Pleistocene period.

*K. Knoch and E. Reichel* <sup>5</sup> on the *Distribution and Annual March of Precipitation in the Alps*.—This work is the first attempt to summarize all the monographs and separated data published in four different countries, in three different languages. In the first chapter the authors discuss the origin of the data used.

The second chapter is a discussion of the distribution of the precipitation. The first problem to be solved was the drawing of the different maps. The greatest possible accuracy was obtained, but even in spite of the careful work the authors do not claim to present the actual, accurate amount of precipitation, but to give a basis for comparison regard to the precipitation and the height of the Alps.

There are five distinct regions (1) the dry region of the southern French Alps, relatively low, and in the Mediterranean climatic influence; (2) wet, west and north front Alps, first condensation of the westerly winds; (3) wet region of south and east Switzerland, warm south foehn and the uplift of the warm air masses by the influx of northern cold air; (4) the rainy region of the southeastern

Alps, the nearness of the Adriatic Sea; (5) the dry regions of southwestern Switzerland and of the zone of the central Alps, rain shadow.

The dryness of the valleys is due to rain shadow affect. Interesting phenomenon is that of the rain beam. Every valley opens into a region of more precipitation, thus the isohyets of lesser precipitation form closed line on the valley bottoms. The amount of precipitation in the valleys depends entirely upon the direction of the valley in regard to the winds, and every change in direction results in a change in precipitation.

As to the theoretical maximum zone of precipitation lower than the maximum height of the mountains, the authors maintain that this does not exist in the Alps.

The third chapter deals with the yearly march of precipitation. The chief types are (1) summer rain, July maximum; (2) transition types; (3) equinox type, May and October maximum; (4) French type, October maximum; (5) highland types, irregular maximum.

In the fourth chapter the authors briefly discuss the variability of the means and the absolute variability of precipitation.

The last 30 pages are devoted to tables containing the mean annual precipitation values of all the stations available and their heights above sea level, monthly values and the monthly proportions of the yearly total, extreme monthly and yearly values, comparisons of the 10 and 20 years means with that of 40 (30) years.

There are four supplements, one precipitation map of the Alps (1:925,000), and 27 small maps showing the location of all the stations, the distribution of different types of rainfall, the maximums, the minimums, etc.

The greatest value of the work lies in the compiling of the material, in the careful examination and interpretation of the data, the preparing of the great number of graphs, diagrams, and maps; also, its style which is easily readable and lacking the general long sentences of the German scientific writings.—*Sigismond R. Diettrich, Clark University.*

## BIBLIOGRAPHY

By C. FITZHUGH TALMAN, in charge of Library

### RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

**Bosch, [J.] & Bosch, [A.]**

*Meteorologische Instrumente.* Freiburg i. B. [1930.] unpub. illus. 23 cm. [Katalog Nr. 25.]

**Curry, J. C.**

*Climate and migrations.* Washington. 1930. p. 423-435. figs. 24½ cm. (Smith. report, 1929.)

**Gorton, A. F.**

*Forecasting seasonal precipitation in California. Its relation to electric power production.* p. 996-1001. figs. 30½ cm. (Journ. Amer. inst. elec. engin., v. 49, Dec. 1930.)

**Haeuser, J.**

*Ein Wolkenbruch von aussergewöhnlicher Stärke über München und Umgebung am 25. Juli 1929.* München. n. d. unpub. figs. 30 cm. (Wasserkraft und Wasserwirtschaft. Heft 18, 1930.)

**Hanna, H. C.**

*Effect of volcanic dust on earth temperatures.* 4 p. illus. 28 cm. (Volcano letter. Hawaiian volcano observ., National Park, Hawaii. no. 307. Nov. 13, 1930.)

**Harrington, F. M., & Morgan, George W.**

*Dry-land shelter-belt tests at the northern Montana branch station.* Bozeman. n. d. 16 p. illus. 22½ cm. (Univ. Montana. Agr. exp. sta. Bull. no. 235. Oct. 1930.)

**Hettner, A.**

*Die Klimate der Erde.* Leipzig. 1930. 115 p. figs. 22 cm. (Geogr. Schriften, Heft 5.)

**Holdeweiss, Paul.**

*Agrarmeteorologie; die Abhängigkeiten der Ernteerträge von Wetter und Klima.* Berlin. 1930. vii, 107 p. diagrs. 24 cm.

**Jensen, I. J., & Harrington, F. M.**

*Dry-land shelter-belt tests at the Judith Basin branch station.* Bozeman. n. d. 27 p. illus. 22 cm. (Univ. Montana Agr. exp. sta. Bull. no. 233. Oct., 1930.)

**Johnson, James Halvor, comp.**

*Concerning the aurora borealis.* [Berkeley, 1930.] 29 p. front. 23½ cm.

**Kerner-Marilaun, Fritz.**

*Paläoklimatologie.* Berlin. 1930. viii, 512 p. figs. 25 cm.

**Libia. Ministero delle colonie.**

*Atlante meteorologico della Libia.* n. p. 1930. 35 p. illus. plates. 25 cm.

**Perlewitz, Paul.**

*Wetter und Mensch.* Leipzig. 1929. 279 p. illus. plates. 19½ cm.

**Pernice, Erich.**

*Der Spreewald als Gewitterherd. Ein Beitrag zur Erklärung der Vorgänge in Gewitterherdgebieten.* Greifswald. 1930. 71 p. figs. 23 cm. (Inaug.-Dissert, Friedrich-Wilhelms-Universität zu Berlin.)

**Ridgley, Douglas C., & Koeppe, Clarence E.**

*College workbook in weather and climate.* Bloomington. c1930. 128 p. figs. 26 cm.

**Rochaix, [A.]**

*Atmosphère et climats ... 2ème éd. de Atmosphère et climats par J. Courmont et Ch. Lesieur.* Paris. 1929. xx, 136 p. figs. 24½ cm. (Traité d'hygiène. 1.)

**Vogel, Hans.**

*Die Atmosphärische Zirkulation über Australien.* München. 1929. p. 179-237. plates. 24 cm. (Mitt. d. Geogr. Ges. München. Bd. 22, 2. Heft. Dez. 1929.)